Draft

April 5, 1990

Mr. K. W. Sommerfeld
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Oak Ridge, Tennessee 37831-8005

Dear Mr. Sommerfeld,

Burns & Roe Utility Management Consultants, Inc. is pleased to provide you with the enclosed report covering the support and assistance provided to the management of the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio.

This report covers the same information already provided to the Plant Manager and his subordinates during the course of the visit.

If you have any questions, we would be glad to provide additional information.

Sincerely,

Paul Early
Team Leader

MANAGEMENT ASSISTANCE REPORT

PORTSMOUTH
GASEOUS DIFFUSION PLANT

MARCH 12 - APRIL 5, 1990

BURNS & ROE UTILITY MANAGEMENT CONSULTANTS, INC.

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1. EXECUTIVE SUMMARY

A team of five consultants provided assistance and support to the Portsmouth Gaseous Diffusion Plant management in striving to improve performance to conform with INPO guidelines.

Of the sixteen components described in the Uranium Enrichment Performance Improvement Program, the team's comments and suggestions involve thirteen.

The cooperation and kindness provided by the employees of the Portsmouth Plant is most appreciated.

The team agrees that the managers need to develop the will to improve, to accept risk, to know the details of the activities of their units, and to understand and exercise the concepts of accountability, responsibility, and authority.

The team also agrees that managers need to coordinate their decisions with each other in mutual support of the plant mission; need to provide subordinates, and particularly the hourly workers, with the reasoning behind directives; and need to be responsive to the supportive efforts of their subordinates, particularly the hourly workers.

Both the Radiological Protection and the Quality Assurance/Quality Control Programs are unsatisfactory. This is a management defect which rises above the immediate managers. The presently planned contamination control program is too vague and unrealistic for implementation. A training program is necessary, and a planned characterization survey should be aggressively implemented. There is no Quality Assurance or Quality Control activity of importance which supports the plant.

The condition of Emergency Preparedness planning is also unsatisfactory. The senior managers have removed themselves, in the planning documents, from their responsibilities and control.

Collectively, the managers must create plans of action and schedules to accomplish what has to be done using the present resources on hand. Repeatedly, corrective actions are predicated on increases in the budget and additional staff, (a convenient way of deferring action items).

2. INTRODUCTION

During the period from March 12 to April 5, 1990, five persons, experienced in nuclear power operations and the application of INPO guidelines, visited the Portsmouth Gaseous Diffusion Plant. They met with many of the managers, supervisors, supporting staff, production, and maintenance personnel and observed practices in various parts of the plant.

The Portsmouth plant staff has planned some improvements which would enable them to meet the higher performance standards now required. A review of the progress to date was made.

Individual meetings resulted in the transfer of information designed to assist all levels of management to reach a better understanding of the steps needed for further progress. Information developed at the Paducah Plant was used to expedite the progress at Portsmouth.

This report is a series of comments to permit recall of the points already stressed in the visit. The symptoms indicated identify the generic issues which should be addressed.

While this report is in sections, it should be noted that suggested improvements in one area might well require activity by more than one of the many departments at Portsmouth. In addition to the following comments, other observations, comments, and suggestions which support these views have been provided in detail to various managers.

The team appreciates very much the courtesy and cooperation provided to it in its effort to provide assistance in improving performance.

Attachment 1 provides guidance for managers of model/lead facilities. The team members are listed below. Briefs of their experience are provided in Attachment 2. The assigned scope of work is shown as Attachment 3.

Byron H. Collier, Project Corporate Sponsor

Paul J. Early, Team Leader

Willis J. Ford

James P. Forsyth

Luther D. Yarger

3. MANAGEMENT

The award-fee system, as applied, may be counterproductive to improving plant performance. To improve plant performance, it is necessary to determine the root causes of the many symptoms and to have clear vision and opportunity to address appropriate corrective actions. To maximize the award-fee, however, from the contractor's viewpoint, an immediate adjustment is necessary for essentially every opinion or list of symptoms offered by the DOE employees and consultants. The contractor's employees see success in maximizing the award-fee coupled directly to their performance appraisals and pay adjustments. The DOE employees, however, see success in limiting the award-fee coupled directly to their performance appraisals, and thus they originate and track many requirements. The result is that the mission is forgotten and many symptoms are fixed while root causes languish.

The Portsmouth Plant's mission should be established and promulgated. Goals, objectives, short term action plans, and dated commitments using present resources to best advantage could then be established.

Managers need to develop the will to improve. They do not believe that radical change is necessary or that it will take place. Initiative is missing. The senior managers feel that they have little room to maneuver between what they see as inhibiting forces. They have developed a barricade of paper procedures and memos behind which they await direction. They produce long range plans based on additional resources. They have not accepted the risk of implementing change with present resources.

A chasm exists between upper level management and the first line supervisors and hourly employees. This void has led to frustration and distrust on the part of the work force. The managers need to develop a healthy continuing exchange of ideas, information, and guidance between managers and the work force. Ideas and information must be solicited from subordinates. Encouragement can be by examples of appropriate consideration and promptly announced decision. Directives should be given together with the need or reasoning behind them. Labor relations problems are often being used as an excuse not to manage.

Division and Department Managers all need to coordinate their organizations in support of the plant mission. A healthy exchange of information is lacking between them in spite of the numerous "informational meetings" they hold where issues are not debated. Managers should not make decisions which impinge upon other divisions or departments without seeking their active cooperation. A large number of departmental procedures exist which clearly assign responsibilities to other jurisdictions. These allow departments not to fulfill their responsibilities to support the plant mission. The managers have accepted this situation by not seeking and knowing the details of the work in progress in their areas. Dictates from various staff levels outside and inside the plant are accepted as valid without consideration of the consequences. As a result several of the programs in place use overly conservative criteria. These result in significantly excessive costs or tasks and generate undue quantities of variously contaminated waste.

There is no evidence that anyone at the upper management levels has the background to provide the guidance and direction needed to establish a realistic and practical contamination control program. The processing of visitors to the process buildings is not credible and is an embarrassment to management.

Neither the Quality Assurance/Quality Control organization nor the Radiological Controls organizations comprised of both "contamination control" and "health physics" are satisfactorily performing their duties. This is a management defect which rises above those immediate managers.

4. OPERATIONS

A Conduct of Operations manual using gaseous diffusion plant terminology and based on INPO guidelines has been published in final form.

Draft safety and caution tag procedures are under review by the electrical safety committee, the safety department, production, and maintenance personnel.

The activities of the internal group and the functional working group for operations have been reviewed. Those long term issues for which additional resources are required have been identified. Action plans for completion of short term items such as designation of "at the controls areas" in control rooms are being developed. The efforts of the two groups are complimentary.

Methods for the reduction of paperwork, improvement of communication, establishment and achievement of short and long term goals have been discussed at length.

The support of operations by staff groups is less than adequate. QA/QC, radiological protection, safety and industrial hygiene are all prone to request operations to perform administrative tasks for them. In addition, they generally do not see themselves in a support role to operations.

Several managers stated that in the past supervisors spent much more time with the workers and that things went better then. There is little apparent recognition that the same kind of communication is necessary today if matters are going to improve. The current administrative load, largely self imposed, is a major deterrent to such communication. Lack of focus caused by a lack of a clearly defined mission and goals contributes to the confusion. The result is that most of the employees are trying to manage large amounts of superfluous information with the same priority as the important issues require.

The same lack of focus in the other areas has a significant impact on the Production Division which is the organization made responsible for the implementation of programs developed by others. Procedures and policies developed by the other organizations place requirements and responsibilities on the Production Division without having been coordinated with other efforts in progress and without regard to resource requirements.

The concept of having fully integrated crews for each shift in each process building should be considered with the aim of improving both contamination control and maintenance/operational coordination. The control of work in radiological areas and the reduction of contaminated areas would be more easily addressed with a team effort.

A plant policy should be developed and implemented for post maintenance testing of all equipment or systems returned to Production control by a maintenance group. Post maintenance testing procedures should, where possible, ensure repaired equipment or systems are fully operational to design standards.

~~It was alleged in discussions that on occasion operators have defeated compressor seal alarms. Defeating any alarm is an unsatisfactory operating practice. In view of the frequent seal failures now being experienced, this allegation is disturbing. Production management should investigate this matter objectively, and provide plant management with the results of the investigation, the steps taken, and the assurance provided that this unsatisfactory practice has been corrected.~~

5. MAINTENANCE SUPPORT

CONDUCT OF MAINTENANCE

Both Portsmouth and Paducah Plants have issued a common Conduct of Maintenance document based on the INPO guidelines. Implementation has begun at Portsmouth by initiating an assessment process to determine how closely existing maintenance and supporting practices conform to the specific guidelines.

Presently 66 specific elements have been listed. Individuals have been tasked to determine what is needed to conform to each element. In some cases no additional activity may be necessary. These cases will be documented to show how the current process conforms with the element. The assessment process is to be completed by April 4, 1990. Division management will then review the assessments. Individuals will be assigned to carry out the actions required to meet each specific element. Completion dates and priorities will be assigned. This straightforward approach should continue to completion.

WORK AUTHORIZATION AND CONTROL

The Work Authorization and Control System provides good data which may be displayed in numerous ways. If modified, it could provide other valuable management information, such as an accurate backlog, delay causes, and reasons for "holds" on MSRs.

The Maintenance Service Request (MSR) backlog apparently is not all inclusive. All known work is not entered. Only work defined by submitting an MSR is entered into the system and tracked. Many deficiencies in various cells are listed only in local logs. MSRs are not prepared until the cell is isolated for other reasons. Therefore when a cell is brought off the line, the true amount of work needed on that cell is not known. Preparations for the work are not complete or planned. There may be other examples. Since the true amount of work outstanding is not fully identified in the MSR system, the sizeable backlog already identified is likely to be much larger.

About half of the defined MSR backlog is not in a "Ready-to-Run" status. While the individual planner may know why MSRs are on "hold", management does not have a means in the Work Authorization and Control system to identify problem areas.

Examples of the causes are the lack of part, material, tools, drawings, and procedures, and the inadequacy of repair equipment.

The age of MSRs is not reviewed or trended to identify adverse situations.

Forty percent of MSRs written are assigned Priority 2 by the requestor when by definition they are of lower priority. Priority assignments are not reviewed at an adequate managerial level to determine its validity. The priority system thus does not function as a useful tool in schedule making. Some MSRs are marked as "safety" related to get a high actual priority. Daily work schedules prepared by the planners are upset by the late introduction of MSRs for additional and unscheduled work on equipment taken out of service for repair.

Operational acceptance of equipment should be verified by the Production Division by a signature on the MSR, a post-maintenance test form, or an operational check list. The Work Authorization and Control system does not require a formal sign-off by the originator of the MSR. While the first line maintenance supervisor acknowledges that the work is complete, a determination that the equipment is capable of operating satisfactorily has not been made. The clearance of an EWP or HWP does not satisfy a post-maintenance test of operability or approval of restoration of the work site.

PRODUCTIVITY

Actual delays which reduce productivity are not evaluated by management to identify and correct the causes.

The delay codes which would provide this data are not fully utilized. The fear exists that reporting a delay would adversely reflect on the performance of the first line supervisor. Many delays are not under his control; for examples, delays in obtaining radiological controls surveys, decontamination by chemical operators, or approvals on work permits. These delays can prevent the start of work and are also preventing the rescheduling of the working crafts.

The lack of transportation is frequently a cause for delay. Tools, equipment, and material must be brought to the work site. These delays can be reduced in several ways; more specialized equipment, faster turn around in vehicle maintenance, or reassignment of the work force and work to three shifts. Reassignment of the work force has been done in the cascade buildings with shift crews and self-directed teams in place.

Managers of shop facilities should consider if this is necessary in their areas.

Procurement procedures introduce delays in many routine maintenance and housekeeping functions. Standard parts and supplies require a lengthy requisition and approval process. The Purchasing Department is considering a blanket order process for vehicle parts and accessories. Such open purchase requisitions in other areas such as carpentry, painting, and janitorial supplies could reduce delays affecting other crafts. The 789 vehicles on site require a responsive maintenance program.

The compressor seal failure rate is presently exceeding the seal repair rate. It is now simply a matter of time, estimated as two months, before the supply of spare seals is depleted. There are two bottlenecks involved in seal repair. The issues should be addressed quickly. The alternative is to reduce power.

Delays on jobs involving several crafts and services from outside the process buildings can be reduced through improved coordination. One means would be to assign a person or persons from Chemical Operations and Health Physics, for examples, to the general supervisor of each process building and possibly X-720. They would be able to respond quickly to the needs of the work in progress since the supervisor knows the sequence of the functions needed. The supervisor would then be fully responsible for the progress of the work. He would have in effect a multi-craft crew. There appears to be enough work available to warrant this arrangement. Continuing types of activities such as routine surveys or area decontamination could be used as fill-in when direct job support is not needed.

Automatic welding machines and automatic cutting machines should be obtained to dress and prepare the joint surfaces on compressors and converters in the shop as well as the fixed piping ends in the cells. These machines can be set up on portable jigs to fit each of the large pipe ends. They can deposit metal much faster and with much better quality than can be done by hand. The cutting machines can make both a better face surface and the joint notch than can be done by hand. Grinding dust will be significantly reduced making the work areas safer and cleaner. These machines have been used for years, are of proven reliability, and are available on the market.

MEASURING AND TEST EQUIPMENT

The Measuring and Test Equipment (M&TE) program is part of the overall calibration program. It does not meet the currently required standards except as applied to Radiac instruments. The Radiac Calibration Lab is well run with good facilities and tracking for equipments; however, independent and adequate QA/QC support has not been provided for this work.

Electronic calibrations are well documented, but the mechanical calibration area lacks the necessary standards for torque wrench, temperature, flow, and pressure calibrations.

An overall procedure for the control and calibration of M&TE equipment needs to be written to provide necessary detailed guidance. A draft procedure using INPO Good Practices for calibration and control of M&TE has been provided.

An equipment list defining M&TE equipment that should be in the system is needed. The INPO definition should be followed as guidance. Requirements for each equipment; i.e., frequency, calibration procedure, and so forth, should be provided. The equipment list and associated information should be put in the Automatic Scheduling Program for control. A separate list for equipment sent to vendors for calibration should be developed. Groups outside of maintenance that may have equipment used to calibrate other systems should be included in this program.

Priority should be given to the instrument laboratory to get the standards established and the physical equipment in place. Calibration and repairs should be separated into different areas as the electronics group has done. Requisitions for 13 standards for various calibrations have been submitted but the equipment has not yet been received.

6. CONFIGURATION CONTROL

The definition of safety systems, and the complete listing and inventory of these systems is weak and of concern. Safety devices, rather than safety systems, are specified in the FSAR and are tested under an Operational Surveillance Program (OSR). The devices are individual items such as rupture disks on heat exchanger shells, indicators and alarms powered from a 120 VAC bus, or sensors such as an autoclave condensate drain conductivity cell.

The systems themselves which contain these devices are not considered safety related as defined in the FSAR, even though the proper operation of the safety related devices depends on their support, such as circuit boards, power supplies, instrumentation, or piping systems.

As a result, modifications can be made to the systems in which these safety devices are a part without engineering and design inputs, drawing changes, design basis comparison, safety evaluations, and formal management approval. The degradation of the safety device that may be caused by the system modification cannot be determined without these steps. Documentation of the design basis and all modifications for the safety devices is not available.

The investigation report for the calciner level probe calibration (POEF-T-3517, dated December 18, 1989) should be reviewed. It indicates a litany of major issues which confirm that the definition used at both Paducah and Portsmouth for safety systems (actually individual devices) is too narrow. The findings reported that "...all procedures for safety systems are suspect", "...no evidence available to assure that the required pre-operational check-out of the B area calciner safety system had ever been done", "...responsibility spread so broadly no area is held accountable", and "...performed only if a need was perceived by the operator."

The safety system definition should be reviewed with a consideration to revising it to determine specifically the boundaries of each system which is vital to the safe control and indication of the process system; each system which is vital in servicing the process system and feed and tolls operations; each system vital to the prevention of criticality accidents; and each vital power supply for these systems.

Investigation of safety systems preventive maintenance, post maintenance testing, and Maintenance Method (procedure) upgrading, disclosed a number of configuration control discrepancies. Examples of these are;

1. Components in the system not shown on the drawing.
2. Components shown on the drawing are not present in the system.
3. Wiring and control schemes not consistent drawing to drawing or drawing to system.
4. Examples of safety system dependence on non-safety system components to perform their required action.
5. Incomplete Safety System Configuration Control Sheets.

Further investigation of these discrepancies indicated management had been advised, through incident reports, that these problems exist and have existed for some time. These discrepancies were shown to exist in older installed systems as well as recently installed equipment.

7. TRAINING

The recent organizational change to establish an integrated Training Department should create the framework to provide performance-based training at Portsmouth GDP.

The training facilities built for the GCEP project should be made available to the plant's training efforts. Even with these facilities, limited training materials and training personnel will make the task of establishing accreditable training programs in a timely manner, a difficult one. Management support of the training program and long range Quality Assurance oversight will be necessary to ensure quality performance-based training.

Utilizing the INPO guidelines for General Employee Training (GET) (INPO 87-004), establish a training program that will provide all persons working at this plant with a uniform and adequate level of understanding of potential site emergencies, both radiological and industrial, including their individual responsibilities.

GET is a multi-discipline training program consisting of health physics, contamination control, industrial safety, industrial hygiene, security, and emergency planning. Subject matter experts will be necessary to develop and present this training. Assignment of a GET supervisor is strongly recommended to ensure that initial and on-going GET training materials and presentations meet the plant needs and INPO guidelines. Perform a Job Task Analysis for GET Levels I and II Radiation Workers to ensure this training is performance-based. Include maximum applicable hands-on training for each of these training levels. A Quality Assurance oversight activity should be established to ensure quality performance of the GET program and radiation workers' performance in these areas.

The Training Manager should promptly establish, in writing, a mission statement for the Training Department. This statement should leave no doubt as to how the Training Department is to support the plant mission. In addition, the manager should establish the goals of the Training Department for both near term high priority activities, and for long term desirable activities. Each Division Training Coordinator (DTC) should promptly establish, in writing, their division's training goals and objectives in support of the Training Department mission and goals. Periodically, the Training Manager should review, one on one with each DTC, the progress made in meeting the established goals and objectives. The results of these reviews should be trended to ensure timely progress in the accreditation effort. The use of INPO Guide 86-019, Management Objectives Program, could aid in this effort.

The Training Manager should also ensure that the existing Training Manual for Portsmouth GDP, dated March 1989, is promptly revised to reflect the newly created training organization. This manual should include the mission statement and goals of the Training Department as well as the training goals and objectives of the individual divisions.

All classroom and laboratory training should be conducted in the best possible environmental conditions for training. Utilization of the GCEP training facility is strongly recommended to enhance the plant's training activities. Training aids and materials should be maintained up-to-date and in the best physical condition. Training materials developed by the Goodyear Atomic Corp. for original operations and maintenance training should be validated or upgraded and folded into a plant training library. Significant Engineering Division involvement will be required for this materials upgrade to ensure training is in keeping with the current system design criteria. In those systems or equipments for which design criteria is not available, the Engineering Division should develop baseline materials to support the training staff.

Plant management does not have an understanding of the manhours required for training. As a result additional Production and Maintenance staffing requirements to meet the training needs are not identified. Total training hours have been coarsely estimated by the Training Department, but a breakdown by discipline is not available. As a minimum, the following information should be determined and evaluated against plant staffing plans;

a. Total annual predictable on-going training hours for each discipline.

b. Total annual overtime hours required to support the on-going training.

c. Total annual straight time hours required to support the on-going training.

The information should be updated at least quarterly to ensure predictions are accurate and trends identified. A plant goal should be that only unpredicted training should be done on, or result in, overtime.

Production training has a number of good practices in their current training programs. These include;

a. Identified educational requirements for entry into the Production Division.

b. Functional on-the-job-training (OJT) programs utilizing trained OJT instructors.

c. Classroom training on operator actions/expected plant response.

d. Organized lesson plans and disciplined presentations.

The following areas of Production training require improvement;

a. OJT instructors are not periodically evaluated to ensure quality training is provided and adequate standards of trainee performance are sustained.

b. There are no documented qualifications standards for specific shift stations. Therefore there is no standard to which to train or require personnel performance.

c. Current Chemical Operations training is inadequate for persons being introduced into a potentially hazardous work environment. It is done primarily by OJT. Manpower limitations for instructors and trainees are primary contributors to this shortcoming. At least one additional full time instructor should be assigned to Chemical Operations and adequate scheduling done to ensure that trainees receive adequate classroom training.

d. Currently, on-going training of Utility Operators is frequently done one-on-one. This significantly reduces the effectiveness of this training. To improve effectiveness, Utilities Operations management should ensure that operators are assigned to training as a shift unit or team.

e. Generically, a large part of Production training is based on current Methods (procedures). Some Methods are of lower quality than others. This leads to training statements to the effect of "This is what the Method says, but this is what we really do." An unacceptable signal is given the trainee. A vigorous program of Method upgrade should be established to ensure that when an instructor modifies a Method for use in training, a Method change is initiated and promptly completed.

Maintenance training has a number of good practices in their current training programs. These include;

a. Identified educational requirements for entry into the Electronic Technician Department.

b. A professional basic training course and on-going craft enhancement video course for Electronic Techs.

c. Off site, craft specific training.

d. Organized lesson plans and disciplined presentations.

An area that should be improved is the evaluation of training effectiveness. Current practice is based primarily on "feedback from the customer." OJT performance should be monitored by discipline management. Feedback to the Training Department should result in improved training materials and accelerated training schedules as necessary.

A common training weakness with divisions is that there is a need for ongoing job-specific training, but that time is not available. Plant management should ensure that training is considered part of the work to be done and is so scheduled. A second training weakness, with very few exceptions, is Job Task Analysis (JTA) versus Job Analysis. JTA identifies specific tasks associated with specific jobs and identifies Method (procedure) details necessary to perform tasks as well as the performance-based training necessary to ensure quality operation. Job analysis assumes current Methods are sufficient to form the basis of training. Performance-based training is not assured. Thus accreditation of training programs at INPO levels would probably not follow a Job Analysis-based training program.

The training workload generated by the Action Plan Response to Compliance Assessment has not yet been factored into the training schedule. This is a sizable task and requires input to training from "new procedure/plan/policy" writers assigned to meet the various finding requirements. This training task should be formalized. A person or persons should be assigned the responsibility to implement the action plan. Firm dates and scheduled progress reports should be provided to plant management.

Monthly Safety meetings are a good plant practice. However, these meetings are being used as catch-all training periods. Industrial Safety and Hygiene (IS&H) should develop training materials for these meetings based on the likely hazards to be encountered by the trainees. In addition IS&H should play an active role in ensuring that this monthly training time is spent on applicable IS&H matters. Quality Assurance should provide oversight in this important training area.

8. RADIOLOGICAL CONTROLS

The presently planned contamination control program is so vague and unrealistic that the basically untrained plant employees in all divisions will probably not be able to cope with it effectively. A clearly defined training program must be established to enable the various divisions to understand and effectively implement the program. The planned program, if implemented without significant change, will adversely affect production and maintenance activities. It does not appear workable. It will not meet the intent of the DOE/ORO instructions.

Implementation of the General Employee Training Program, INPO 87-004, as recommended in the Training section of this report should meet the need of the plant's contamination control program.

The training program should be designed to help the employees understand and practice such practical matters as the reasons for and techniques of taking and reading swipes and direct surveys; using anti-contamination clothing; entering and leaving a barrier control point; using portable friskers and hand or hand/foot monitors; and segregating low level radiologically contaminated waste from other waste. Detailed lesson plans are necessary, together with instruction provided directly by a subject matter expert. Video presentations could be used to support the lessons plans, but not to replace them.

At the same time, a planned characterization survey program should be aggressively implemented and completed. This would identify in detail the existence or absence of fixed and removable contamination areas in all suspect buildings. Once this has been established, frequent surveys must be carried out to maintain updated conditions on a continuing basis. There appears to be sufficient staff available, but they have not been directed or supervised properly.

Aggressive cleanup of removable contamination should be promptly initiated when found. Those surfaces found to have fixed contamination should be either mechanically cleaned, or sealed with paint or epoxy, so that residual readings are below contamination limits.

By using DOE/ORO contamination limits and nomenclature for the various radiological areas, as well as survey results, cleaning, or sealing; it is probable that nearly all areas may be declared contamination-free. (Except for the situation in X-326 which is not known to the team.)

Production and Maintenance personnel should join with Health Physics expertise to provide management with the recommended arrangement of regulated areas. Contamination areas could then be established, permanently or temporarily, within the regulated areas in a manner which would both rigorously contain contamination and allow reasonable access for operations and vehicular transfers of heavy equipment and tools.

The effort by Martin Marietta Energy Systems Headquarters to establish standards of performance through functional working groups is commendable. Unfortunately, in the area of Radiological Protection, the group did not have sufficient knowledge and experience of the correct measures to be taken. Management interest and guidance to the group was not sufficient to cause them to seek technical help.

The policies being established are not founded on reasonable and proven radiological controls practices. Technical assistance in fundamental training levels is needed at Portsmouth so that management and workers can all be given the understanding necessary to protect themselves properly from the hazards of radiation and contamination. This process was begun at Portsmouth by obtaining a 40 hour course from General Dynamics. The course was given to a few of the many who need it. Twenty hours of the course dealt with radiological controls and is an excellent basis for the General Employment Training. It is insufficient, however, for Radiation Worker II training which requires hands-on practical usage of friskers and anti-contamination clothing.

A simple patch-up will not be sufficient. Management and workers are unaware of proper radiological protection procedures. Health Physics personnel who may have had this training have not been forceful in raising awareness or standards. No worker or manager has called into question the requirement to wash one's hands before using a hand monitor to determine the presence of contamination. While the knowledge of good practices may be present in some of the work force, it has not been called forth to question bad practices or be used to change existing practices.

Trained Chemical Operators, Production Operators, Materials Handling Operators, and Maintenance personnel should be able to take swipe surveys and direct radiation readings using portable radiac instruments. This practice would permit threshold measurements without delay. Surveys for off-site movement of product or equipment should be done for the record by Health Physics staff only.

Health Physics Technicians (Surveyors) should take definitive surveys to support establishing work areas, opening major equipments, in the course of maintenance and production activities, upon close out of spaces or work, and to check on the accuracy of swipe surveys taken by others.

Results of surveys taken by work force personnel must be recorded at the time. Maps of results of surveys taken by Health Physics staff should continue to be given directly to the local supervisor immediately following on-scene activity. The maps must be of the proper scale to indicate the locations of swipes. Engineering drawings of building floor plans are the smallest scale which should be used.

Building supervisors should require the posting of current survey maps at the scene of all work within their buildings and at all building entrances.

The present procedure for the use of hand monitors requires the user to wash his hands before having them counted in the monitor. This is an incorrect radiological controls practice. The practice permits contamination, if it were to be present, to be washed away into the plant sewage system and thus into the environment. This practice may reduce instrument maintenance but will provide a false indication that contamination is not present. It then allows a worker to measure his hands as being uncontaminated when he could have been contaminated and had spread the contaminated matter to his face and clothing before washing. The purpose of the practice is to keep the machine clean instead of using the machine to detect contamination. The proper practice is to use the hand monitors first. If contaminated, the person should remain at the check point and obtain help from Health Physics. Under their supervision, the person can be fully surveyed, decontaminated, and the washings collected.

Health Physics procedures require that airborne particulate activity samples be taken at the scene whenever releases occur. The results were requested for 14 release incidents in the first three months of 1990. The information was not yet available 12 days later. On March 31, however, the reaction to smoke alarms in a cell included sampling for airborne particulate activity on both floors of the process building by the response team. The results were verbally given to the Shift Superintendent as "ok".

9. Quality Assurance/Quality Control

There is no Quality Assurance or Quality Control activity of importance which supports the plant. The Quality Assurance/Quality Control group does not have and does not exercise sufficient independence to conduct an adequate Quality Assurance program. This is apparent in all areas reviewed since, if a viable and independent QA/QC presence existed, issues which were found in Engineering, Maintenance, Training, Radiological Controls, Production, and QA itself, for example, would have been known and recognized by management. Other sections of this report identify situations where appropriate QA/QC activity should have identified an issue.

The QA manual should be revised to conform with full application of NQA-1. INPO guidelines are built upon the underlying foundation of NQA-1 and cannot be implemented without the full application of NQA-1. If the MMES position that their Quality Manual, rather than NQA-1, is maintained, as the controlling document, then the Enrichment QA groups will not be able to meet INPO guidelines, and the plants will not have been brought into line with the INPO guidelines.

The MMES QA manual directs the activities of all the QA organizations in the five plants. This direction does not fully implement NQA-1 philosophy or requirements such as the independence of the QA/QC functions and staff from line requirements; the qualification for auditors; and the functional definition of quality with respect to purpose.

A separate Internal Audit group exists which reports to the Plant Manager. Their functions are apparently similar to those of the Quality Assurance group. These two groups should be combined and should report to the Plant Manager so that all areas of plant functions come under independent review.

Both enrichment plant QA manuals clearly state that the Division Managers each are responsible for the scope and timing of QA activities within their divisions including the decision to investigate incidents. As a result, there is no QA activity or influence in such matters as radiac instrument calibration, inspection of overhauled equipment, radiological protection, process building activities, and training programs. The objectivity and thoroughness of investigating incidents to determine root causes and lessons learned is unsatisfactory.

The use of the Incident Report system is inadequate to correct or improve plant conditions. The QA department does not use them effectively to correct deficiencies through Quality Investigations.

Incident Reports

Reviews of Incident Reports (Quality Event Reports (QERs)) to decide if action is warranted are perfunctory. Reviews of QERs do not generally result in;

a. Objective decisions regarding the need for further investigations.
b. Thorough investigations where appropriate
c. Determination of cause
d. Identification of corrective actions
e. Completion of corrective actions
f. Training for appropriate personnel involved in like work for lessons learned.

A Quality Investigation Team should be assigned by the QA Manager, using a sufficient number of qualified and trained professionals, to make a thorough review and determine the root causes. The team should never be less than two, plus the QA specialist. The QA manager should make the decision to invoke a Quality Investigation, not the manager concerned. An incident report dated March 9, 1990 concerning raffinate solution unexpectedly found in a tank trailer, did not have an investigation team assigned until early April.

QA has no program to follow up on uncompleted Quality Investigation Reports (QIRs). Follow up on recommended actions is done by computerized reporting once the QIR is entered by QA. The steps to get from recommended corrective actions to approved and directed actions is not clear. It is controlled by the Division Manager who ordered the investigation. QA is not involved in the decision process. Approved and directed corrective actions are identified by Division Managers and tracked as commitments by QA.

Experiences from incident reports and QIRs are not factored into the permanent training program lesson plans.

The review of about twenty-seven 1990 QERs indicated the following salient points:

a. Corrective actions are not identified as a result of many of them.

b. In spite of recognized personnel errors indicating a lack of training or the need for corrective training, in only one case was training scheduled. Twenty-five percent of the training scheduled is one month overdue.

c. In one, a repeated safety system/device trip had not been reviewed diligently for the cause. A Quality Investigation Team, appointed some time after the event, has not yet completed its investigation. The judgments indicated on other QERs has also been not to investigate the causes to conclusion.

d. "No further action required" or "will correct" are examples of close out statements made on QERs. No evidence of follow up to actual closure of the issues exists.

e. In one incident, heat was applied in the presence of oil and caused a fire. The Safety Department was indicated as being involved. No corrective action or training was indicated as having been accomplished.

f. In another incident, information was not passed properly between shifts leading to a spread of contamination. Supervision at the scene was inadequate. No corrective action was taken.

Quality Investigation Reports (QIRs)

A serious incident occurred in August 1989. Incident Report 714-89-022, QI 427, UOR POEF-QI-427-X-342-89-02 refers.

A worker was asphyxiated and recovered. The Quality Investigation was poorly made and was incomplete in its scope. No root causes for the incident were identified. The incident itself was not objectively stated. The worker did not faint as was written up in the QIR and the UOR; he was asphyxiated and recovered. Quality Assurance did not act to review and reject this QIR as insufficiently thorough. No attention was paid to the following lapses which permitted this incident to occur;

1. Spray painting 9 months earlier obscured any piping designations.
   a. Did the Maintenance Service Request (MSR) require finish painting of the pipes?
   b. Did QA/QC inspect the work upon completion?
   c. Did the Building Supervisor sign off on the work as completed?
2. The unmarked piping was identified as an issue at a safety meeting 6 months prior to the incident.
   a. Why did management not react? (Division Manager, Building Supervisor, Safety Manager, and QA Manager)

3. Were the uniqueness of the fittings on the breathing air system compromised by unauthorized usage on other systems? Was there a requirement that they be unique?
4. Were the fittings installed on the nitrogen system as an unauthorized modification? Is there a plant requirement prohibiting system modifications without appropriate authorization and without engineering review?
5. Have all service gas systems throughout the plant been examined to insure that the breathing air system fittings are unique?
6. Why was the Portsmouth response to the DOE generic safety letter insufficient in identifying the breathing air system problem?

The corrective actions were insufficiently broad to resolve all the issues raised in this report;

1. No managerial lapses were identified and corrected.
2. No organizational weaknesses which prevented an adequate investigation were identified and corrected.
3. No improvements were made of the MSR system, painting practices, acceptance of work by user, and quality control review.
4. No changes were identified or acted upon to provide better engineering control over drawings and modifications as needed/not needed.

Unusual Occurrence Reports (UORs)

For the one UOR of 1990 to date, involving a dropped cylinder containing liquid uranium hexafluoride, handwritten operating instructions were immediately promulgated with the requirement for mandatory reading. These operating instructions had not been approved by the Division Manager. No additional training was prepared for crane operators. Five recommendations were made in the QIR. No root causes of the incident were established.

Quality Control, instead of supporting Production and Maintenance, recently requested those supervisors to provide them with information on lifting fixtures so that the QC data base could be improved. The list provided only serial numbers and did not provide any description or identifying data. No offer of assistance was made.

Quality Assurance procedures contain a number of requirements for actions by persons other than QA persons. These actions include the initiation of various reports regarding off-normal conditions. Currently there is no effort made to provide training the "others" on their QA responsibilities.

10. HUMAN RESOURCES

LABOR RELATIONS

Several issues should be considered together to support improved operations. These issues, if resolved in favor of MMES, would significantly assist in improving safe operations, enhancing productivity, and improving economic health to Portsmouth.

1. Limit overtime so that no person works on site more than 12 straight hours.
2. Change the overtime sequence system to one requiring only qualified persons to be called for overtime requests. The present system is based on seniority and prevents calling anyone except from the top of the list, whether or not qualified and trained for the particular task at hand.
3. If shift turnovers require paying for additional time, limit overtime to 30 minutes for these cases, rather than the standard minimum of 4 hours for an unexpected call to work.

4. Control realignment to require adequate numbers of fully qualified and trained operators available on each shift at both the old and new assignments before a transfer is permitted. In turn, a shorter training period on the record, should be available to the transferee based on his prior qualifications and ability to demonstrate his knowledge of the new assignment. Each job assignment should have documented standards to ensure that adequate levels of performance can be uniformly evaluated.
5. Establish pay levels for hourly employees within position assignments which will provide increased pay for advanced performance and training after certain periods of time in grade at that position.
6. Balance/adjust pay structure to recognize risk, skills, and standard of performance required in the materials handling and process control of uranium hexafluoride.

MANAGEMENT/HOURLY EMPLOYEE INTERFACE

Improve the lines of communication between all levels of management and the hourly employees in both directions. Demonstrate to the hourly employees that management wants and is receptive to their good ideas and comments.

Train salaried persons on operating positions so that qualified salaried persons are available to investigate incidents, in case of a walkout, and as an experienced source for management succession.

POSITIVE DISCIPLINE

Encourage objective reporting on off-normal conditions by decoupling reporting and retraining from disciplinary actions.

11. MODEL FACILITY

The Model Facility, X-344, has made significant progress, particularly in radiological protection, since it was last viewed in early February 1990.

The Model Facility manager has opened a receptive line of communication with his workers to obtain their ideas on improvements and concerns for proper operations. He has established a system of informing those who enter the building of his expectations regarding their activities.

The radiological control area has been markedly reduced. Requirements for the use of protective clothing are posted. Supplies of protective clothing are being built up. Supplies of reusable yellow shoe covers seem adequate. Latex surgeon's gloves are not yet available. Additional signs clearly indicating the area classification should be provided to mark the area bounded by the chains. The barrier control point is well thought out.

It is not clear, from the signs, whether a regulated area or a contamination area has been established inside of that barrier control point. The presence of protective clothing supplies indicates it is a contamination area. Since the barrier control point marks the transition from a contamination area to a regulated area, a contaminated area sign should be placed on the chain to mark its purpose. The regulated area sign should be placed a few feet away from the step-off pad to mark the transition from regulated area to a non-radiological area. Another frisker should be placed there as well. Since a contaminated area must be within a regulated area, it appears that a narrow regulated area would also be necessary surrounding the contaminated area in the autoclave room.

It was noted that when work which might cause significant contamination to occur is to be done, a special work area is planned. This temporary area would be wholly enclosed within the regular contamination area and would be fitted with its own barrier control point for egress to the contaminated area. This is a good idea to prevent the possible spread of more highly contaminated material.

The X-720 building and the weld shop have taken the initiative to reduce the radiological areas and establish barrier control points. As a result, they have progressed at least equally as well as has the X-344 building.

12. EMERGENCY PREPAREDNESS

Management has totally abrogated its responsibilities for Emergency Preparedness by delegating all functions to lower echelons and without exerting control, overview, and training. Thus Emergency Preparedness at this plant is unsatisfactory.

The emergency planning function is not centrally controlled. The emergency philosophy section of the Plant Emergency Manual(POEF-1161) states "Emergency planning, execution and implementation of Emergency Planning Staff activities are the responsibilities of Division Management." Further, the manual goes on to state that "To recommend policy, establish procedure, review and update existing procedures and provide for Staff action, an Emergency Planning Staff will meet at regular intervals." This staff is a committee composed of individuals from each of the divisions. To expect these individuals to maintain a level of knowledge that will enable them to make reasonable determinations of the requirements of emergency planning in the present day is unreasonable.

The emergency management team only provides advice to the Plant Emergency Director. The Crisis Manager never assumes control of the emergency. The organization chart shows the Plant Manger's organization as reporting to the Plant Emergency Director by dotted line.

The assignments of responsibility are diffuse and repetitive. Each division is responsible to develop its own Divisional Emergency Manual. Copies are to be kept current at all times. Division Supervision and Facility Managers are responsible to appoint local emergency directors, local emergency squads, and building wardens in all buildings and other areas under their jurisdiction where emergency potentials exist. They are also to assure that these personnel are properly trained, equipped, and drilled. Handicapped employees who work, or visit, in any building, or area, are to be provided assistance, if needed, and when required. Division supervision and facility supervision shall plan, develop procedures and assign assistance as required, to assure handicapped personnel are evacuated to safe areas during an incident. Finally, they are required to provide documentation of an annual review of the Plant Emergency Manual and applicable Divisional Manuals to Emergency Preparedness.

Facility Custodians are required to maintain Facility Emergency Packets. These contain: an audit page; a table of contents; critical action, equipment or material listings; general building layout drawings or sketches; facility utility services; lists of facility tenant organizations; facility emergency systems and equipment; lists of hazardous, toxic and or radioactive materials, including all compressed gasses; copies of local spill plans. These packets are to be updated semi-annually or more frequently if changes occur.

Each division is required to have an emergency preparedness committee. One of the functions of this committee is to provide a copy of training documentation to Emergency Preparedness.

In the construction engineering area the emergency management department has no responsibility in the training or orientation of contractor employees.

Part II-C, page 1, paragraph 2 of the plant emergency manual addresses "Air Raid Alerts and/or warnings(all types)". It then says "During normal office hours - Monday through Friday". No other time period is addressed.

Secretaries are responsible for the implementation of personnel accountability plans.

SPP H-6 details 20 responsibilities of the plant emergency director. Some of these responsibilities seem more appropriate to emergency planning.

The Emergency Planning Appraisal committee inappropriately fulfills a QA function.

The operational emergency preparedness plan is vague and does not contain firm commitments for the completion of improvement items.

The emergency exercise scheduled for April 4, 1990 was delayed because most of the senior management was in Lexington for a meeting. This opportunity to test the emergency response capability under realistic conditions has been lost. Drills are conducted on day shift, during normal working hours and with advance notice. Drills on weekends, nights, and unannounced drills are not scheduled for 1990.

Members of the response team carry pagers so that in the event of an emergency they may be contacted. Tests of this system have a success rate of about 55 percent in contacting the responders. Memos sent to managers regarding this response level have had little effect in improving the response.

Reports of response team performance and the tracking and correction of identified deficiencies are not timely.

GUIDELINES FOR MODEL/LEAD FACILITY MANAGERS

The following is offered as guidance for the individual Model/Lead Facility Managers.

In order to achieve the Model/Lead Facility desired ultimate condition, first a thorough indoctrination of all the personnel assigned must be accomplished. An understanding of the goals and objectives in upgrading an individual facility to model/lead status, and how that supports the plant mission, "To enrich uranium safely, in an environmentally sound manner, economically on a 24 hour basis in accordance with DOE guidelines." is essential to success.

Where and how do you start? The first priority is the proper attitude of all involved in the facility, from the manager who is responsible for that facility, through all of his organization; and all who directly support the activities of the facility.

Once a conscientious decision has been made to upgrade a facility, the manager must create a realistic yet aggressive plan of action and schedule. The plan describes how the objectives will be accomplished. The plan uses resources and

ATTACHMENT 1

assets presently available, plus those that can be enlisted from direct support organizations, without depending upon or requiring additional staffing or immediate budget augmentation. (Long range efforts may eventually identify and justify the need for both.)

Elevated standards of cleanliness and a positive attitude on the part of all facility employees starts "today" in the plan of what is to be done.

What is a "positive attitude" and how is it demonstrated? One way is for facility team members to immediately identify (introduce) themselves to any unknown persons or other managers appearing in the facility, and ask what they can do to help and is there any questions they can answer. Being polite and courteous makes a great initial impression. The cleanliness and orderliness of the spaces, and the general squared away appearance of the workers, sends a very positive message to people entering a facility.

Facility employees must establish a mind-set to continually seek out and correct material deficiencies accepting that superior performance and appearance is the new norm.

ATTACHMENT 1

Order your priorities. Everything cannot be accomplished overnight. Your plan of action demonstrates that you have identified what has to be done, and your schedule is evidence that you are working towards orderly accomplishment of obtaining your objectives. In order for your plan of action and schedule to have credibility, they must both be "living"; adjusted and modified as need be to make them the documents that defines where you are at any given time, and what yet has to be done.

It is unrealistic to expect allocation of money and personnel to return selected facilities to their original like-new condition. However, by having a dedicated and concerned work force, who are encouraged to be constantly aware of the need and requirement for improvement in both performance and appearance, the facilities and operations can truly become "Model" Facilities.

ATTACHMENT 2

TEAM MEMBERSHIP

Paul J. Early, Team Leader

23 years experience in nuclear power operations
Chairman, HFIR Evaluation Committee, 1989
Member, BNL HFBR Restart Team
Senior Vice President, New York Power Authority, managing construction of nuclear plant major modifications, etc.
Initial Senior Member, Nuclear Propulsion Examining Board
Retired Navy Rear Admiral with nuclear experience dating from 1953

Willis J. Ford

32 years experience in nuclear power operations
Member, HFIR Evaluation Committee, 1989
INPO Team Leader
Supervisor, Nuclear Operations Division, Rancho Seco
Certified Senior Reactor Operator BWR and PWR
Retired Navy Senior Chief Electronics Technician, Nuclear

James P. Forsyth

38 years experience in nuclear power operations
8 years INPO
3 1/2 years as Manager Emergency Preparedness
3 1/2 years as Manager, Events Analysis
Corporate and power plant evaluation team manager
Retired Captain, U.S. Navy

Luther D. Yarger

24 years experience in nuclear power operations
Member DOE Savannah River Reactor Oversight Office, 1989
9 years with INPO
Team leader for 23 plant evaluations; member of 27 corporate evaluations
Retired Captain, U.S. Navy

Byron H. Collier, Project Corporate Sponsor

32 years experience in nuclear power operations
President, Burns and Roe Utility Management Consultants
Project Manager BNL HFBR Restart Organizational and Operational Assessment
Senior Consultant to Office of Energy Research for Reactor Operations
Chief Engineer and Nuclear Project Manager, Stone & Webster Engineering Corporation
President, Power Management Associates
President, Executive Consultants to Management
Retired Captain, U.S. Navy